2011 Imaging Criteria

Positron Emission Tomography (PET), PET/CT (Custom) - UDOH[1, 2*MDR, 3, 4, 5]

Created based on InterQual Subset: Positron Emission Tomography (PET), Whole Body
Version: InterQual® 2011

CLIENT:	Name	D.O.B.	ID#	GROUP#
CPT/ICD9:	Code	Facility	Service Date	
PROVIDER:	Name		ID#	Phone#
	Signature		Date	

ICD-9-CM: 92.18

INDICATIONS (choose one and see below)

- ☐ 100 Non-Hodgkin's/Hodgkin's lymphoma
- ☐ 200 Melanoma
- ☐ 300 Non small cell carcinoma of the lung
- ☐ 400 Colorectal cancer
- ☐ 500 Esophageal cancer
- ☐ 600 Breast cancer
- ☐ 700 Head/neck cancer
- ☐ 800 Suspected recurrent thyroid cancer
- ☐ 900 Cervical cancer stage IIB-IVA
- ☐ 1000 Ovarian cancer
- ☐ 1100 Multiple myeloma
- ☐ 1200 Soft tissue sarcoma and baseline scan as part of staging
- ☐ 1300 Pancreatic cancer and baseline scan as part of staging
- ☐ 1400 Testicular cancer and baseline scan as part of staging
- ☐ Indication Not Listed (Provide clinical justification below)

- ☐ 100 Non-Hodgkin's/Hodgkin's lymphoma **[One]**[6]
  - ☐ 110 Baseline scan as part of staging
  - ☐ 120 Baseline scan positive **[One]**[7]
    - ☐ 121 Restaging after chemotherapy/radiation completed[8, 9]
  - ☐ 130 New/worsening Sx/findings with known lymphoma **[One]**[10]
    - ☐ 131 Enlarged lymph nodes[11]
    - ☐ 132 CT/MRI suspicious for recurrence/metastasis
    - ☐ 133 CT/MRI nondiagnostic for recurrence/metastasis

☐ 200 Melanoma **[One]**[12, 13, 14]
- ☐ 210 Baseline scan for Stage III/Stage IV disease[15]
- ☐ 220 Baseline scan positive **[One]**[7]
  - ☐ 221 Restaging after chemotherapy completed[8, 9]
- ☐ 230 New/worsening Sx/findings with known melanoma **[One]**[16]
  - ☐ 231 Enlarged lymph nodes[17]
  - ☐ 232 CT/MRI suspicious for recurrence/metastasis
  - ☐ 233 CT/MRI nondiagnostic for recurrence/metastasis

☐ 300 Non small cell carcinoma of the lung **[One]**[18*RIN]
- ☐ 310 Baseline scan as part of staging[19]
- ☐ 320 Restaging after surgery/radiation completed[9]
- ☐ 330 Suspected recurrence by CXR/CT/MRI[20, 21, 22]

☐ 400 Colorectal cancer **[One]**
- ☐ 410 Baseline scan as part of staging[23]
- ☐ 420 Restaging after Rx completed[9, 24]
- ☐ 430 Suspected recurrent colorectal cancer **[Both]**[25]
  - ☐ 431 CEA increasing/elevated[26]
  - ☐ 432 CT/MRI nondiagnostic for colorectal cancer[27]

☐ 500 Esophageal cancer **[One]**
- ☐ 510 Baseline scan as part of staging[28]
- ☐ 520 Restaging after chemotherapy/radiation completed[8, 9]
- ☐ 530 New/worsening Sx/findings with known esophageal cancer **[One]**[29]
  - ☐ 531 CT/MRI suspicious for recurrence/metastasis
  - ☐ 532 CT/MRI nondiagnostic for recurrence/metastasis

☐ 600 Breast cancer **[One]**[9, 30]
- ☐ 610 Restaging for suspected recurrence/metastases and CT/MRI nondiagnostic[31]

☐ 700 Head/neck cancer **[One]**[32]
- ☐ 710 Baseline scan as part of staging
- ☐ 720 Baseline scan positive **[One]**[7]
  - ☐ 721 Restaging after chemotherapy/radiation completed[8, 9]
- ☐ 730 New/worsening Sx/findings with known head/neck cancer **[One]**[33, 34]
  - ☐ 731 Enlarged lymph nodes[35]
  - ☐ 732 CT/MRI suspicious for metastasis/nodal disease

- ☐ 733 CT/MRI nondiagnostic for metastasis/nodal disease

☐ 800 Suspected recurrent thyroid cancer **[All]**[36]
- ☐ 810 Papillary/follicular carcinoma by Hx[37*RIN, 38]
- ☐ 820 Post thyroidectomy and ablative RAI therapy[39]
- ☐ 830 Thyroglobulin > 10 ng/mL[40, 41]
- ☐ 840 Whole body RAI scan nondiagnostic for metastasis/recurrence[42]

☐ 900 Cervical cancer stage IIB-IVA **[One]**[43*MDR, 44, 45]
- ☐ 910 CT/MRI suspicious for extra-pelvic metastases
- ☐ 920 CT/MRI nondiagnostic for extra-pelvic metastases
- ☐ 930 Restaging after chemotherapy/radiation completed[9, 46]

☐ 1000 Ovarian cancer **[One]**[47, 48]
- ☐ 1010 Baseline scan as part of staging
- ☐ 1020 Restaging after Rx completed[9, 49]
- ☐ 1030 Suspected recurrent ovarian cancer **[Both]**
  - ☐ 1031 CA-125 increasing/elevated[50, 51]
  - ☐ 1032 CT/MRI suspicious/nondiagnostic for recurrence

☐ 1100 Multiple myeloma **[One]**[52, 53]
- ☐ 1110 Baseline scan as part of staging
- ☐ 1120 Baseline scan positive **[One]**[7]
  - ☐ 1121 Restaging after chemotherapy[9]
- ☐ 1130 New/worsening Sx/findings with known myeloma **[One]**[54]
  - ☐ 1131 X-ray/CT/MRI suspicious for recurrence/metastasis
  - ☐ 1132 X-ray/CT/MRI nondiagnostic for recurrence/metastasis

☐ 1200 Soft tissue sarcoma and baseline scan as part of staging

☐ 1300 Pancreatic cancer and baseline scan as part of staging

☐ 1400 Testicular cancer and baseline scan as part of staging

Notes

(1)
These criteria include the following procedure:
PET/CT Fusion

(2)-MDR:

Available evidence does not demonstrate that PET imaging for prostate cancer improves physician decision making in determining treatment strategy; therefore requests for whole body PET for prostate cancer require secondary medical review.

(3)
The use of whole body PET for the clinical management of solid tumors is widespread and increasing in the US (Podoloff et al., J Natl Compr Canc Netw 2009; 7 Suppl 2: S1-26). The National Oncologic PET registry (NOPR) has been collecting data on the efficacy of PET for the Center for Medicare and Medicaid Services (CMS) (Hillner et al., Cancer 2009; 115(2): 410-418). Recently updated guidelines include evidence-based recommendations for coverage of many tumor types that are biopsy proven or strongly suspected on other diagnostic testing.

(4)
While CT or MRI provides anatomic information that is helpful in the evaluation of cancer, the utility of these studies is often limited by scarring or benign postoperative changes that can be difficult to differentiate from tumor. PET scans image metabolic function and can distinguish between benign and malignant changes by utilizing a radiolabeled tracer, most commonly ^{18}F-fluorodeoxyglucose (FDG), which is incorporated into tumor cells more avidly because of higher metabolic rates. PET is appropriate to determine management for biopsy proven cancer; it is not used to establish a diagnosis of cancer (Podoloff et al., J Natl Compr Canc Netw 2009; 7 Suppl 2: S1-26). The National Oncologic PET Registry (NOPR) has recently assessed how FDG-PET affects care decisions and reports that PET results alter management in over 36% of cases and enable physicians to avoid additional tests and procedures (Hillner et al., J Clin Oncol 2008; 26(13): 2155-2161).

(5)
Virtually all newly installed PET systems in the U.S. are PET/CT systems, rather than dedicated stand-alone PET units. PET/CT is increasingly used to diagnose suspected cancer, for initial staging, for restaging after completion of therapy, and for suspected recurrence (Blodgett et al., Radiology 2007; 242(2): 360-385). Therefore, PET/CT may be utilized for any oncological indication where PET scanning is considered appropriate.

(6)
Non-Hodgkin's lymphoma and Hodgkin's disease may be symptomatic (e.g., fever, weight loss, night sweats) or may be suspected by virtue of enlarged lymph nodes. Imaging is required to document the extent of lymphatic involvement because management is affected by the results (Kumar et al., Radiol Clin North Am 2004; 42(6): 1083-1100, viii). Conventional CT and gallium scan have traditionally been used to guide therapy, assess tumor response, and assess possible recurrence; however, PET has replaced gallium scan for the staging and evaluation of lymphoma and is useful in guiding therapy and determining recurrent disease (Podoloff et al., J Natl Compr Canc Netw 2007; 5 Suppl 1: S1-S22; quiz S23-22).

(7)
A repeat scan is usually not necessary unless the initial scan was positive.

(8)
PET has proven more reliable in identifying responders after treatment, while CT is not always able to differentiate tumor from inflammatory reactions, edema, and scar tissue.

(9)-POL:
PET/CT Scanning performed at least three weeks after chemotherapy or chemoimmunotherapy completion

(10)
New or worsening symptoms and findings include night sweats, weight loss, ESR > 30 mm/hr, or temperature > 100.4 F(38.0 C) ≥ 1 week of unknown etiology. Patients with suspected recurrence or metastatic disease undergo CT or MRI as the initial study.

(11)
PET/CT is appropriate as the first line study in cases of enlarged lymph nodes in patients with known lymphoma.

(12)-DEF:
Melanoma is a malignant tumor of melanocytes, which are found predominantly in skin.

(13)
The incidence of melanoma is increasing more rapidly than any other malignancies, at a rate of > 4% per year (Jemal et al., CA Cancer J Clin 2008; 58(2): 71-96). Although the precise pathogenic etiology of melanoma is unknown, risk factors such as association with intermittent, intense sun exposure, older age, and exposure to pesticides have been identified (MacKie et al., Ann Oncol 2009; 20

Suppl 6: vi1-7). A family history of melanoma increases a patient's risk for developing melanoma.

(14)
PET scanning is used for the evaluation of metastatic and recurrent melanoma (Choi and Gershenwald, Surg Oncol Clin N Am 2007; 16(2): 403-430). PET has an accuracy of 81% for detecting recurrence, compared to 50% to 60% for standard imaging techniques (Fuster et al., J Nucl Med 2004; 45(8): 1323-1327). Compared to other imaging studies, PET is also more accurate in identifying the extent of metastatic disease (Kumar et al., Radiol Clin North Am 2005; 43(1): 23-33).

(15)
Stage I or Stage II disease is defined as a melanoma of any thickness with or without ulceration, and the absence of nodal, satellite, or distant metastases. Sentinel lymph node biopsy is performed for clinical Stage I and II melanomas. Stage III or IV disease is defined as melanoma that has spread to nearby lymph nodes or beyond. PET is part of the baseline evaluation for stage III or IV melanomas. PET is not appropriate for initial staging of melanoma without clinically suspected metastases (Clark et al., Arch Surg 2006; 141(3): 284-288).

(16)
Patients with suspected recurrence or metastatic disease undergo CT or MRI as the initial study. New melanotic cutaneous lesions require biopsy.

(17)
PET/CT is appropriate as the first line study in cases of enlarged lymph nodes in patients with known melanoma.

(18)-RIN:
These criteria address whole body PET scanning in the setting of known non small cell carcinoma of the lung. For criteria addressing PET evaluation of a solitary pulmonary nodule, see the "Positron Emission Tomography (PET), Chest" criteria subset in the *Chest & Heart* category.

(19)
Non small cell carcinoma of the lung most commonly metastasizes to the mediastinal lymph nodes, and staging requires accurate assessment of these lymph nodes. CT can identify the presence of enlarged nodes, which were considered to be metastatic by size alone; however, PET is significantly more accurate in identifying large benign nodes and also small malignant nodes (Wynants et al., Radiol Clin North Am 2007; 45(4): 609-625, v). Definitive staging requires mediastinoscopy for tissue biopsy of positive lymph node findings on PET.
Non small cell carcinoma of the lung may also metastasize to distant sites. Staging with whole body PET is useful in identifying these foci of disease, with better sensitivity and specificity than imaging with CT (Silvestri et al., Chest 2007; 132(3 Suppl): 178S-201S).

(20)
CXR, CT, or MRI performed for periodic follow-up may demonstrate equivocal findings that are suspicious, but not diagnostic, for recurrent non small cell carcinoma of the lung (Pieterman et al., N Engl J Med 2000; 343(4): 254-261). In patients with a history of lung cancer treatment, PET has a sensitivity of 98% and specificity of 87% in detecting recurrent non small cell carcinoma of the lung (Mavi et al., Radiol Clin North Am 2005; 43(1): 1-21, ix).

(21)
Periodic imaging studies are performed to assess for recurrent cancer in patients with a history of non small cell carcinoma of the lung. The frequency of these studies is a matter of clinical judgment.

(22)
PET is not recommended as a primary surveillance method in treated patients; however, it is recommended when CT identifies a suspicious lesion (Podoloff et al., J Natl Compr Canc Netw 2007; 5 Suppl 1: S1-S22; quiz S23-22).

(23)
Whole body PET is able to identify metastatic disease that is not detected by CT (Rohren et al., Radiology 2004; 231(2): 305-332). For patients diagnosed with colorectal cancer with metastatic liver disease, the appropriate surgical intervention (e.g., hepatic resection, radiofrequency ablation, cryotherapy) depends on accurate staging to identify the extent of liver involvement, the location of metastatic sites, and the absence of extrahepatic metastases. Detecting disease that is not identified by conventional imaging (e.g., CT, MRI) prior to surgery is crucial in identifying whether or not a patient is suitable for hepatic resection. Studies have shown that PET is valuable when used in conjunction with CT to determine those patients appropriate for hepatic resection and those in which hepatic resection would be futile (Ruers et al., J Nucl Med 2009, 50: 1036-41).

(24)
Surgery, radiation therapy, and chemotherapy are treatment options for colon cancer (Fauci, ed. Harrison's principles of internal medicine. 2008). PET is used to differentiate recurrent or residual tumor from treatment changes (Blodgett et al., Radiology 2007; 242(2): 360-385).

(25)
PET is performed for patients with suspected colorectal cancer recurrence when the CEA level is elevated and the conventional imaging work-up is negative (Manning et al., Mol Imaging Biol 2007; 9(6): 324-332; discussion 323).

(26)
Elevations of CEA levels, particularly if persistent, increasing, or > 5 ng/mL, signal the need for diagnostic imaging for localizing recurrent disease; for these patients, PET accurately detects recurrence (Kyoto et al., Ann Nucl Med 2010).

(27)
CT and MRI are limited in their ability to differentiate recurrence from benign postoperative changes and can underestimate metastatic disease to the peritoneum, mesentery, and lymph nodes. The major benefit of PET is avoiding futile surgeries by documenting widespread disease.

(28)
Although PET has limited ability to detect dissemination to locoregional lymph nodes, it can detect metastatic disease that may not be identifiable with other methods (Sandha et al., Gastrointest Endosc 2008; 67(3): 402-409; Bruzzi et al., Radiographics 2007; 27(6): 1635-1652).

(29)
Symptoms of recurrent esophageal cancer include dysphagia, hoarseness, and pain. Such symptoms warrant an upper GI endoscopy with biopsy and chest CT or MRI prior to PET/CT.

(30)
PET is not recommended for routine axillary staging of newly diagnosed breast cancer due to low sensitivity (Fletcher et al., J Nucl Med 2008; 49(3): 480-508; Podoloff et al., J Natl Compr Canc Netw 2007; 5 Suppl 1: S1-S22; quiz S23-22).

(31)
Approximately 35% of patients with a history of breast cancer treatment will experience recurrence within a 10 year timeframe. Conventional imaging studies used for restaging breast cancer (e.g., CT, bone scan) rely on anatomical changes to identify recurrence. In patients treated with radiation or surgery for breast cancer, differentiating new tumor from scar tissue or necrosis can be difficult. The addition of PET to routine imaging can detect metabolic cellular changes (e.g., increase glucose uptake due to tumor cell growth) before anatomical changes occur, helping to determine appropriate treatment options (e.g., surgery, radiation therapy, chemotherapy) (Fletcher et al., J Nucl Med 2008; 49(3): 480-508; Mahner et al., Ann Oncol 2008; 19(7): 1249-1254; Eubank, Radiol Clin North Am 2007; 45(4): 659-667, vi). The use of PET is generally discouraged for evaluating metastatic disease except in situations where the results of other imaging studies are equivocal (Carlson et al., J Natl Compr Canc Netw 2009; 7(2): 122-192).

(32)
Most head and neck cancers present as squamous cell carcinoma of the larynx, pharynx, and the oral cavity. Patients most often present with an enlarged cervical node since these tumors tend to metastasize to regional lymph nodes (Fletcher et al., J Nucl Med 2008; 49(3): 480-508).

(33)
Symptoms and exam findings of head and neck conditions include pain, difficulty speaking, eating, or swallowing, aspiration, trouble moving the tongue or mouth, a new mass, enlarged lymph nodes, or a change in the PE findings at the primary site (e.g., edema).

(34)
CT or MRI is preferred as the first step in evaluating most new or worsening symptoms in patients with known head or neck disease. PET/CT is performed in addition to CT or MRI because head or neck cancer is highly likely to metastasize and PET/CT provides better information on nodal disease and contralateral involvement than either CT or MRI alone (Blodgett et al., Radiology 2007; 242(2): 360-385).

(35)
PET/CT is appropriate as the first line study in cases of enlarged lymph nodes in patients with known head or neck cancer.

(36)

PET can detect the presence of recurrent thyroid cancer in patients with elevated thyroglobulin levels and nondiagnostic whole body RAI scans (Fletcher et al., J Nucl Med 2008; 49(3): 480-508). A retrospective study evaluating the use of PET/CT in patients suspected of having recurrent papillary carcinoma found 100% specificity (Nahas et al., Laryngoscope 2005; 115(2): 237-243). PET can identify metastatic disease and provide information to determine treatment options (e.g., surgery, high-dose RAI, external beam therapy).

(37)-RIN:

The use of whole body PET for other types of thyroid cancer, which are considered uncommon (e.g., Hurthle cell, tall-cell, insular) are not covered by this criteria.

(38)

Papillary and follicular carcinoma, known as differentiated thyroid cancers, account for over 90% of thyroid malignancies. Differentiated thyroid cancer has an excellent prognosis, with the majority of patients living at least 15 years after initial diagnosis. Although mortality rates are low, the rate of disease recurrence ranges from 15% to 22% for papillary carcinoma and 35% for follicular carcinoma (Cohen et al., Otolaryngol Clin North Am 2003; 36(1): 129-157). Risk factors for poor prognosis include older age at the time of initial assessment, large tumor size, local invasion, and distant metastases. Prognosis is also worse in patients who develop recurrence (Mackenzie et al., Med J Aust 2004; 180(5): 242-247; Cohen et al., Otolaryngol Clin North Am 2003; 36(1): 129-157; Thyroid Carcinoma Task Force, Endocr Pract 2001; 7(3): 202-220).

(39)

Treatment for patients with differentiated thyroid carcinoma includes thyroid removal, usually followed by RAI ablation. The extent of the surgery (e.g., partial thyroidectomy versus total thyroidectomy) is based on the risk of recurrence, as well as the potential use of RAI. With ablative RAI therapy, iodine 131 (^{131} I) is used to destroy thyroid tissue after thyroidectomy and to treat thyroid cancer. A whole body RAI scan is performed 6 to 12 months after ablation to monitor for recurrent thyroid cancer (Pazdur et al., Cancer management: a multidisciplinary approach: medical, surgical, and radiation oncology, 7th ed. 2003, p.).

(40)

Thyroglobulin is a protein synthesized by the thyroid gland and is useful as a marker for recurrence when following patients with follicular or papillary carcinoma.

(41)

After thyroidectomy and RAI ablation, thyroglobulin levels should be undetectable (< 2ng/mL). Thyroglobulin levels > 10 ng/mL measured after thyroid hormone withdrawal suggest recurrent disease (Thyroid Carcinoma Task Force, Endocr Pract 2001; 7(3): 202-220; Cailleux et al., J Clin Endocrinol Metab 2000; 85(1): 175-178). The presence of thyroglobulin antibodies may impact the reliability of the thyroglobulin measurement by producing falsely high or low results, therefore samples submitted for thyroglobulin determination should be screened for thyroglobulin antibodies (Thyroid Carcinoma Task Force, Endocr Pract 2001; 7(3): 202-220).

(42)

A whole body RAI scan is used in the postoperative management of differentiated thyroid cancers to monitor for metastatic disease. Well-differentiated thyroid tumor cells will concentrate iodine allowing for better detection of metastatic disease on ^{131} I whole body scans (Cohen et al., Otolaryngol Clin North Am 2003; 36(1): 129-157; McDougall et al., Nucl Med Commun 2001; 22(5): 485-492). As thyroid cancer spreads, the cancer cells become poorly differentiated, losing their ability to concentrate iodine, causing a false negative whole body RAI scan in approximately 20% of all differentiated metastatic thyroid cancers (Frilling et al., Ann Surg 2001; 234(6): 804-811).

(43)-MDR:

Since the management of patients with Stage IVB cervical cancer is not likely to change based on PET scan results, requests for whole body PET in these cases require secondary medical review.

(44)

Cervical cancer is staged clinically by inspection and palpation of the cervix, vagina, and pelvis, and by examination of the extrapelvic areas, chiefly the abdominal and supraclavicular lymph nodes.

The International Federation of Gynecology and Obstetrics (FIGO) system is used to classify cervical cancer. Stage I cervical carcinoma is strictly confined to the cervix. Stage II cervical cancer extends beyond the cervix and involves the vagina (not the lower third) but does not extend into the pelvic wall. Stage III cervical cancer extends to the pelvic wall or involves the lower third of the vagina. Stage IV cervical cancer extends beyond the pelvis and involves the bladder or rectum.

(45)
Studies have shown PET scan to be more accurate in identifying pelvic and para-aortic lymph node metastases than CT and MRI. Accurate staging of cervical cancer is critical to identify appropriate treatment options (e.g., chemotherapy, radiation therapy) (Podoloff et al., J Natl Compr Canc Netw 2009; 7 Suppl 2: S1-26; Hricak et al., J Clin Oncol 2005; 23(36): 9329-9337).

(46)
PET has been shown to influence ongoing treatment decisions or avoid aggressive surgical treatment for patients with distal disease by detecting recurrence or non-response to therapy (Podoloff et al., J Natl Compr Canc Netw 2009; 7 Suppl 2: S1-26; Schwarz et al., JAMA 2007; 298(19): 2289-2295).

(47)
Since early-stage ovarian cancer produces vague, non-specific symptoms, most cases of ovarian cancer are suspected only after the tumor has grown large enough to be palpable or has spread beyond the ovary. Screening of the general population with transvaginal US or analysis of CA-125 levels is advocated by some, but the positive predictive value and specificity of these tests are low and the efficacy of this approach has not been established (American College of Obstetricians and Gynecologists, Obstet Gynecol 2008; 111(1): 231-241; Buys et al., Am J Obstet Gynecol 2005; 193(5): 1630-1639).

(48)
PET scan has been reported to have a high sensitivity and specificity for diagnosing ovarian cancer (Podoloff et al., J Natl Compr Canc Netw 2009; 7 Suppl 2: S1-26).

(49)
Primary treatment for ovarian cancer is surgical resection, followed by chemotherapy.

(50)
CA-125 antigen is a protein expressed on the cell membrane of normal ovarian tissue and ovarian carcinomas. A normal serum level is < 35 U/ml. CA-125 is elevated in 85% of women with advanced ovarian cancer but has a high false negative rate for early-stage cancer so cannot be used as a discriminatory test to assess the need for surgery. Monitoring of ovarian pathology with periodic CA-125 measurement in combination with transvaginal US may be of benefit for small, benign-appearing cysts or tumors (Buys et al., Am J Obstet Gynecol 2005; 193(5): 1630-1639).

(51)
PET can confirm recurrence of ovarian cancer in patients with an elevated CA-125. The early detection of recurrence may influence treatment options (Iyer and Lee, AJR Am J Roentgenol 2010; 194(2): 311-321; Risum et al., Int J Gynecol Cancer 2009; 19(4): 600-604).

(52)-DEF:
Multiple myeloma is a malignant disorder defined by the clonal proliferation of plasma cells that produce a monoclonal protein. This disorder may result in bone marrow tumors, anemia, thrombocytopenia, amyloidosis, and osteolytic bone lesions which can lead to pathological fractures, hypercalcemia, a depressed immunologic system, and renal failure.

(53)
Although x-rays of the axial skeleton and large cortical bones, (skeletal survey) are used to detect bone changes ("punched-out lesions") and MRI is used to detect spinal disease (cord compression), PET is more sensitive in finding bone lesions. PET is most useful when used in combination with other tests (Podoloff et al., J Natl Compr Canc Netw 2009; 7 Suppl 2: S1-26).

(54)
The imaging study chosen (x-ray, CT, MRI) for suspected recurrence of multiple myeloma depends on the type and location of symptoms.